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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,423	02/27/2004	Harald Bottner	20659/0203719-US0	5684

38881 7590 09/11/2006

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EXAMINER

SANDVIK, BENJAMIN P

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/789,423

Applicant(s)

BOTTNER ET AL.

Examiner

Ben P. Sandvik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1,3 and 7-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2, 4-6, 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 6/23/2006 have been fully considered but they are not persuasive. In regard to the rejection of claims 2 and 4, the applicant argues that the Tauchi and Hayes references do not disclose a eutectic Bi/Au mixture *and* a bismuth layer. Claim 2 recites "at least one soldering layer made from a solder comprising *at least one of* a eutectic mixture of gold and bismuth and a bismuth layer for producing a soldered joint with a gold layer". This limitation is interpreted by the examiner to mean *either* a "eutectic mixture of gold and bismuth" *or* "a bismuth layer for producing a soldered joint with a gold layer", but not both of these. Hayes teaches a gold/bismuth eutectic; all of the limitations of claim 2 are taught by Tauchi and Hayes, hence the rejection is maintained.

In regard to the rejection of claim 5, the applicant argues that the amended limitation "each substrate has a thermoelectric material facing the other substrate arranged thereon" is not disclosed Tauchi. In arguing this claim the applicant argues that "the thermoelectric materials are not facing each other." It appears that this argument is erroneous as this limitation is not found in the claim. Furthermore, each substrate of Tauchi has a thermoelectric material arranged thereon, the thermoelectric material extending to and in contact with the other substrate. The examiner believes that this configuration is sufficient to read on the limitation "each substrate has a thermoelectric material facing the other substrate arranged thereon". Hence, the rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2, 4-6, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tauchi (U.S. Patent #5966939), in view of Hayes et al (U.S. Patent #6077380).

With respect to **claim 2**, Tauchi teaches a microelectromechanical component having at least one soldering layer for joining at least one further component, but does not teach a soldering layer comprising at least one of a eutectic mixture of gold and bismuth and a bismuth layer for producing a soldered joint with to a gold layer. Hayes teaches a component having at least one soldering layer for joining to at least one further component (Fig. 9a, the layer formed by balls 108), which component includes at least one soldering layer made from a solder comprising a eutectic mixture of gold and bismuth (Col 6 Ln 64 to Col 7 Ln 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a solder as taught by Hayes in the structure of Tauchi in order to optimize the fabrication process of the device.

With respect to **claim 5**, Tauchi teaches a soldered joint (Fig. 1, 22) that joins at least two components, at least one component comprising at least two substrates (Fig. 1, 11 and 12) joined together by said solder, and each substrate

has a thermo electric material (Fig. 1, 25 and 26) arranged thereon; but does not teach a solder comprising a eutectic mixture of gold and bismuth. Hayes teaches a component having at least one soldering layer for joining to at least one further component (Fig. 9a, the layer formed by balls 108), which component includes at least one soldering layer made from a solder comprising a eutectic mixture of gold and bismuth (Col 6 Ln 64 to Col 7 Ln 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a solder as taught by Hayes in the structure of Tauchi in order to optimize the fabrication process of the device.

With respect to **claim 6**, Tauchi teaches that the thermoelectric material is arranged in the form of a Peltier cooler.

With respect to **claim 22**, Tauchi teaches that the at least one component has a thermal functionality (Col 3 Ln 43-46).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tauchi and Hayes, in view of Kuramoto (U.S. PG Pub #2001/0020744).

With respect to **claim 4**, Tauchi does not teach that at least one soldering layer, prior to the soldering operation, has a layer thickness of 100 nm to 10 micrometers. Kuramoto teaches a solder layer prior to soldering that has a thickness range of between 7 and 40 micrometers (Fig. 3, 14 and as set forth in claim 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the solder layer of Hayes to be 100 nm to 10

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micrometers based on the teachings of Kuramoto in order to provide enough solder to make a reliable connection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben P. Sandvik whose telephone number is (571) 272-8446. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bps



EVAN PERT
PRIMARY EXAMINER